جمهورية مصر العربية

وزارة التربية والتعليم
والتعليم الفني

نموذج إجابة
امتحان شهادة إتمام الدراسة الثانوية العامة
للعام الدراسى ٢٠١٧/٢٠١٦ ـ الدور الأول

المــادة : الديناميكا (باللغة الالمانية)

نموذج

أ

Fragengruppe von .... bis ..	Die Punkte
1 → 5	7
6 → 8	6
9 → 12	7
13 → 16	5
17 → 18	5
Die Summe	30

1-

(d) $2\,v\,x$ △1

2-

(b) 2 △1

3-

(i) $\because v = 6t - t^2$

$\therefore\ a = \frac{dv}{dt} = 6 - 2t$ △$\frac{1}{2}$

Bei $t = 2$ $\quad \therefore a = 6 - 4 = 2\,m\,/\,sec^2$ △$\frac{1}{2}$

(ii) $x = \int v\,d\,t$

$\therefore\ x = \int (6\,t\ - t^2)dt$ △$\frac{1}{2}$

$= 3t^2\ - \frac{1}{3}\ t^3 + k$ △$\frac{1}{2}$

Bei $t = 0\quad , x = 0$

$\therefore 0\ = 0 - 0 + k$

$\therefore\ k = 0$ △$\frac{1}{2}$

$\therefore\ x = 3t^2\ - \frac{1}{3}\ t^3\quad \therefore\ x = 3(2)^2\ - \frac{1}{3}\ (2)^3 = \frac{28}{3}\,Meter$ △$\frac{1}{2}$

$\therefore\ x = \int_0^2 (6\,t\ - t^2)\ dt$ △$\frac{1}{2}$ $\quad = \left(3t^2\ - \frac{1}{3}\ t^3\right)_0^2$ △$\frac{1}{2}$

$= 3(2)^2\ - \frac{1}{3}\ (2)^3$ △$\frac{1}{2}$ $\quad = \frac{28}{3}\,Meter$ △$\frac{1}{2}$

Andere Lösung für (ii)

4-

(c) 30000 kg. m/sec △1

5-

(b) 7,68 △1

6-

(c) Beschleunigung von 1,2 m / sec^2 nach oben 1

7-

Erstens: In der Luft $\because\ v^2 = u + u^2 + 2\,g\,S$ $\frac{1}{2}$

$\therefore v^2 = 2 \times 9{,}8 \times 1{,}4$

Zweitens: Im Sand

$\because v^2 = u^2 + 2\,g\,S$

$\therefore Null = 2 \times 9{,}8 \times 1{,}4 + 2a \times 0{,}1$

$\therefore a = -137{,}2\ m / sec^2$ $\frac{1}{2}$

$\because mg - \mu = m \times a$ $\frac{1}{2}$

$\therefore 9{,}8\,m - 225 \times 9{,}8 = m \times (-137{,}2)$

$\therefore 147\,m = 225 \times 9{,}8$

$\therefore m = 15\ kg$ $\frac{1}{2}$

Andere Lösung

$\because P - P_\circ = w$ $\frac{1}{2}$

$\therefore m\,g\,S_1 + (m\,g - \mu)S_2 = Null$ $\frac{1}{2}$

$\therefore m\,g\,S_1 + (S_1 + S_2) = \mu\,S_2$

$\therefore m = \frac{a\,S_2}{g\,(S_1 + S_2)}$ $\frac{1}{2}$

$$m = \frac{225 \times 9{,}8 \times 0{,}1}{9{,}8 \times 1{,}5} = 15\ kg$$ $\frac{1}{2}$

8-

Erstens:

$\because v = u + a\,t$

$Null = 14{,}7 + \frac{3}{2}\,a$

$\therefore a = -9{,}8\ m\ /\ sec^2$ $\frac{1}{2}$

$\because r = g\,t\cos 30^\circ,$ $\frac{1}{2}$

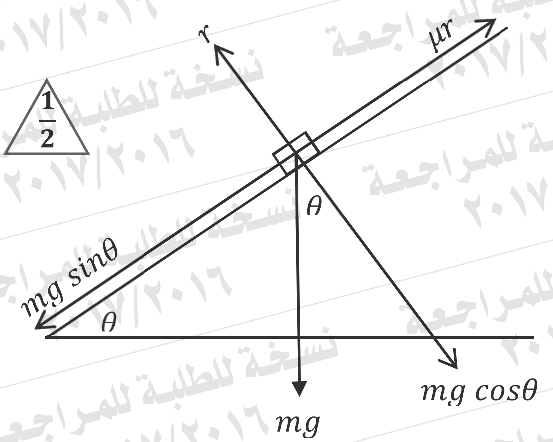
$-\mu\,r - m\,g\sin 30^\circ = m\,a$

$\therefore -\mu \times m\,g\cos 30^\circ - m\,g\sin 30^\circ$ $\frac{1}{2}$

$= 9{,}8\,m$

$\therefore \frac{\sqrt{3}}{2}\,\mu - \frac{1}{2} = -1$ $\frac{1}{2}$

$\therefore \mu = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$



Zweitens:

$\because \lambda\,\frac{\sqrt{3}}{3}$, wobei λ der Reibungswinkel ist. $\frac{1}{2}$

$\therefore \lambda = \theta = 30^\circ$ $\frac{1}{2}$

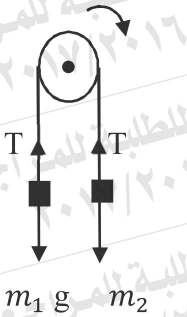
$\therefore$ Der Körper wird nahezu rutschen.

9-

(d) $10^5\ Newton$ $\triangle 1$

10-

(a)



$m_1\,g - T\ = m_{1\times}\,a\ \ \Longrightarrow\ \ (1)$ $\triangle\frac{1}{2}$

$T - m_2 g = m_2\ \times a\ \ \ \ \Longrightarrow\ \ (2)$ $\triangle\frac{1}{2}$

(1) und (2) addieren

$\therefore\ m_1\ g - m_2\,g = (m_1 + m_2)a$ $\triangle\frac{1}{2}$

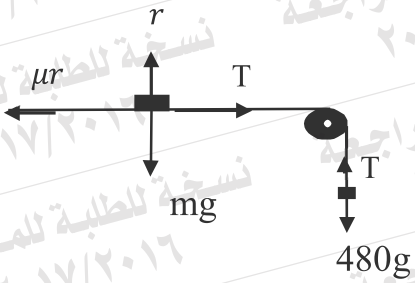
$\therefore\ 980(\,m_1 -\ m_2) = 196(m_1 + m_2)$ $\triangle\frac{1}{2}$

$\therefore\ 5(m_1 - m_2) = (m_1 + m_2)$ $\triangle\frac{1}{2}$

$\therefore\ 4\,m_1 = 6\,m_2$ $\triangle\frac{1}{2}$

$\because m_1 : m_2 = 3 : 2$

(b)



$r\ = m\ g$

$\therefore r = 500 \times 980$

$480\ g\ \ - T = 480\ a\ \Longrightarrow (1)$ $\triangle\frac{1}{2}$

$T\ - \mu\,r\ \ = 500\ a$

$\therefore T\ - \frac{2}{5} \times 500\ \times 980 = 500a\ \ \ \ \Longrightarrow (2)$ $\triangle\frac{1}{2}$

(1) und (2) addieren

$480\ \times 980\ - 200\ \times 980\ = 980\ a$

$\therefore a\ = 280\ cm\ /\ sec^2$ $\triangle\frac{1}{2}$

Von (1) $\therefore t\ = 480\ \times 980 - 480\ \times 280 = 336000$ Dyne $\triangle\frac{1}{2}$

$P\ = 2t\cos 45^\circ$ $\triangle\frac{1}{2}$

$= 2 \times 336000 \times \frac{\sqrt{2}}{2}$

$= 336\,000\,\sqrt{2}\ Dyne$

$= 3{,}36\,\sqrt{2}\ Newton$ $\triangle\frac{1}{2}$

11-

(a) 45 △1

12-

$\because m_1 v_1 + m_2 v_2 = m_1 \acute{v}_1 + m_2 \acute{v}_2$ △$\frac{1}{2}$

$\therefore 100 \times 50 - 50 \times 30 = 100\, \acute{v}_1 + 50 \times 40$

$\therefore \acute{v}_1 = 15\ cm\ /\ sec$ △$\frac{1}{2}$

$\because I = m_2(\acute{v}_2 - v_2)$ △$\frac{1}{2}$

$= 50\,(40 + 30)$

$= 3500 gm.cm\ /\ sec$ △$\frac{1}{2}$

13-

(b) 105 $\overset{1}{\triangle}$

14-

(a) $\frac{1}{64}$ $\overset{1}{\triangle}$

15-

(c) 39 $\overset{1}{\triangle}$

16-

$\because \overrightarrow{S} = \overrightarrow{AB} = \overrightarrow{B} - \overrightarrow{A}$ $\overset{\frac{1}{2}}{\triangle}$

$= (3, 4) - (-1, 2)$

$= (4, 2)$ $\overset{\frac{1}{2}}{\triangle}$

$\because W = F \cdot S$ $\overset{\frac{1}{2}}{\triangle}$

$\because W = (6, -3) \cdot (4, 2)$

$= 24 - 6 = 18$ Arbeitseinheit $\overset{\frac{1}{2}}{\triangle}$

17-

$\because$ die Leistung $= F \times v$ $\frac{1}{2}$

$$\therefore 30 \times 75 = F \times 54 \times \frac{5}{18}$$

$$F = \frac{30 \times 75}{15} = 150\ kg.wt$$

$\because$ Die Geschwindigkeit ist regelmäßig. $\frac{1}{2}$

$\therefore r = F = 150\ kg.wt$ $\frac{1}{2}$

der Widerstand für jede Tonne $= \frac{150}{6}$

$= 25\ kg.wt\ /\ Tonnen$ $\frac{1}{2}$

18-

(a)

$\because T - T_\circ = W$ $\frac{1}{2}$

$\therefore \frac{1}{2} m v^2 = (mg \sin\theta - r)S$ $\frac{1}{2}$

$\therefore \frac{1}{2} \times 0,2 \times v^2 = 0,2 \times 9,8 \times \frac{3}{s} S - r S$ 1

$\therefore 0,1\, v^2 = 0,6 \times 9,8 - 4,48$ $\frac{1}{2}$

$\therefore v^2 = 14 \qquad \therefore v = \sqrt{14}$ m/sec $\frac{1}{2}$

(b)

$MD = 130 \cos\theta$

$= 130 \times \frac{12}{13} = 120\ cm$ $\frac{1}{2}$

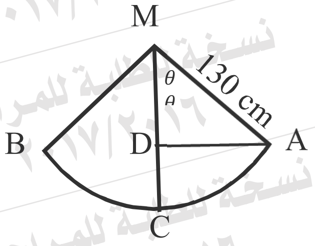
$\therefore CD = 10\ cm$ $\frac{1}{2}$

$\because T_c + P_c = T_a + P_a$ $\frac{1}{2}$

$\therefore 0 + \frac{1}{2} m v^2 = 0 + m\, g\, CD$ $\frac{1}{2}$

$\therefore \frac{1}{2}\ v^2 = 980 \times 10$ $\frac{1}{2}$

$\therefore v = 140\ cm\ /\ sec$ $\frac{1}{2}$



Die Antwort ist zu Ende

(Alle richtige andere Antworten gelten als richig)